

Appl. No. 09/599,870  
Attorney Docket No. 3244-101

### REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

By the present amendment, claims 50, 53 and 57 have been amended, claims 52 and 56 have been cancelled and claims 66-71 are new.

Claim 50 has been amended to specify that the carrier is a matrix of an inorganic glass or a hybrid organic-inorganic glass. Support for this amendment is found on page 19, lines 15-16, of the application as filed. Claim 50 has been further amended to clarify that the biomolecular interaction is formed before entrapment in the matrix. Support for this amendment is found on page 19, lines 10-12, of the application as filed, where it clearly states that "the biomolecular interactions *are formed and incorporated in a carrier*". Finally claim 50 has been amended to incorporate the subject matter of claim 52.

Claims 53 and 57 have been amended to correct their dependency since the claims upon which they previously depended have been cancelled.

Claims 66 and 67 are new and are directed to the carrier of claim 50 and 60, respectively, in the form of spots on the surface of a solid support. Support for new claims 66 and 67 is found on page 26, lines 17-18, and in Figure 22.

Claims 68 and 69 are new and are directed to the carrier of claim 66 and 67, respectively, wherein the spots are formed by pin spotting, stamping, inkjet methods or screen printing. Support for new claims 68 and 69 is found on page 26, lines 18-19.

Claims 70 and 71 are new and are directed to the carrier of claim 50 and 60, respectively, wherein the spots on the surface of the solid support form an array.

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Support for new claims 70 and 71 is found on page 26, line 17, to page 27, line 11, in particular, on page 26, lines 22-23, and on page 27, lines 7-8, and in Figure 22.

The claim amendments have been made without prejudice and without acquiescing to any of the Examiner's objections. The Applicants submit that no new matter has been added to the claims as a result of these amendments and their entry is respectfully requested.

After amending the claims as set forth above, claims 50, 51, 53-55 and 57-66 are pending.

The Official Action dated June 14, 2005 has been carefully considered. It is believed that the claims submitted herewith and the following comments represent a complete response to the Examiner's rejections and place the present application in condition for allowance. Reconsideration is respectfully requested.

#### **Withdrawn Objections**

The Applicants acknowledge and appreciate the Examiner's withdrawal of the previous Office Action's rejections under 35 U.S.C. § 112, second paragraph and § 102 (e).

#### **Claim Rejections - 35 U.S.C. §102(b)**

##### **A. Gray et al. Journal of Immunological Methods 182 (1995) pp. 155-163**

The Examiner has rejected claims 50-52, 54-56 and 61-65 under 35 U.S.C. §102(e) as being anticipated by Gray *et al.* (Journal of Immunological Methods 182 (1995) pp. 155-163). Applicants respectfully traverse this ground for rejection.

##### **1. Summary of Gray *et al.***

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Gray *et al.* teaches a method of using agarose microdroplets to encapsulate cells that secrete their antibody. The agarose is covalently modified with biotin. After cells are encapsulated, avidin is added in excess to create a bridge to bind biotinylated capture reagents, either goat anti-mouse antibody or antigen. After incubation at 37 °C to allow the cell to secrete its antibody, fluoresceinated complementary reporter agents (either antibody or antigen) are added to label the bound secreted antibody.

**2. Gray *et al.* does not teach or suggest forming a biomolecular interaction before entrapment in a matrix or a matrix of an inorganic based glass or a hybrid organic-inorganic glass having a pore size that is selected to inhibit leaching out of the biomolecular interaction or biological species thereof.**

In contrast, the Applicants' claims recite a carrier comprising a biomolecular interaction that was formed prior to entrapment and wherein the carrier is an inorganic glass or a hybrid organic-inorganic glass having a pore size that is selected to inhibit leaching out of the biomolecular interaction or biological species thereof. The matrix of Gray *et al.* is made up of agarose, an organic material not considered to be a glass, and in order for the method described therein to work, at least one of the biological species of the biomolecular interaction must be able to pass into (and therefore out of) the matrix. Accordingly, the Applicants respectfully request reconsideration and withdrawal of this ground of rejection against claims 50-52, 54-56 and 61-65.

**B. Weaver *et al.* U.S. Patent No. 4,959,301**

The Examiner has rejected claims 50-52, 54-56 and 61-65 under 35 U.S.C. §102(e) as being anticipated by Weaver *et al.* (US 4,959,301). Applicants respectfully traverse this ground for rejection.

**1. Summary of Weaver *et al.***

Weaver *et al.* describes the entrapment of biological entities in microdroplets. The microdroplet may be a liquid microdroplet or a gel microdroplet. The liquid microdroplets are very small volumes of predominantly liquid material, said volumes being defined by a boundary comprised of another liquid, such as a non-aqueous fluid,

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or by a permeability barrier such as a membrane such that the membrane is capable of retaining biological entities (see column 7, lines 6-17). The gel microdroplets are porous matrixes with a high water content. Natural and synthetic gel materials are listed in column 8, lines 56-68, of *Weaver et al.*

**2. Weaver et al. does not teach or suggest a matrix of an inorganic based glass or a hybrid organic-inorganic glass.**

In contrast, the Applicants' claims recite a carrier which is an inorganic glass or a hybrid organic-inorganic glass. The matrixes of *Weaver et al.* are microdroplets made up of organic material and are not glasses. The carriers of *Weaver* differ significantly from those covered by the Applicants' claims, in particular with respect to their mechanical strength. Accordingly, the Applicants respectfully request reconsideration and withdrawal of this ground of rejection against claims 50-52, 54-56 and 61-65.

**C. Charych et al. U.S. Patent No. 6,022,748**

The Examiner has rejected claims 50-65 under 35 U.S.C. §102(e) as being anticipated by *Charych et al.* (US 6,022,748). Applicants respectfully traverse this ground for rejection.

**1. Summary of Charych et al.**

As noted by the Examiner, *Charych et al.* teaches a method and composition for direct detection of analytes using color changes that occur in immobilized biopolymeric material in response to the selective binding of analytes to their surface. The biopolymeric material may further comprise a ligand, such as a peptide, antibody, antigen, nucleic acid, biotin etc attached thereto. The biopolymeric material is entrapped in a sol-gel glass. The Applicants note however, that the entrapped biopolymeric material comprising a ligand is entrapped and *then* exposed to analytes that may contain a molecule that will interact with the ligand. Inherent in this method is the fact that the biomolecular interreaction between the analyte and the ligand is not

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formed before entrapment and the pore size of the matrix must be such that at least one of the biological species of the biomolecular interaction must be able to pass into (and therefore out of) the matrix.

**2. Charych *et al.* does not teach or suggest a preformed biomolecular interaction or a matrix having a pore size that is selected to inhibit leaching out of the biomolecular interaction or biological species thereof.**

In contrast, the Applicants' claims recite a carrier comprising a biomolecular interaction that was formed prior to entrapment and wherein the carrier has a pore size that is selected to inhibit leaching out of the biomolecular interaction or biological species thereof. In the method described in Charych *et al.*, only one of the biological species of the biomolecular interaction is entrapped in the matrix and, in order for the method described therein to work, at least one of the biological species of the biomolecular interaction must be able to pass into (and therefore out of) the matrix. Accordingly, the Applicants respectfully request reconsideration and withdrawal of this ground of rejection against claims 50-65.

### Conclusion

The Applicants submit that the present application is in order for allowance. Favorable reconsideration of the application as amended is respectfully requested. Should the Examiner deem it beneficial to discuss the application in greater detail, the Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 02-2095. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge

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the unpaid amount to Deposit Account No. 02-2095. If any further extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. § 1.136 and authorized payment of any such extensions fees to Deposit Account No. 02-2095.

Respectfully submitted,

BERESKIN & PARR

By P. Folkins  
Patricia Folkins  
Reg. No. 51,379  
Tel: 416-957-1683

Encl.